

The Basics of Particle Counting



What is particle counting?

Particle counting is the count of the particulates that are present within a volume of fluid. In oil condition monitoring, we utilize various particle counting methods to monitor the number of particulates that may be present within a sample of lubricating oil.

What are the most commonly applied methods in particle counting?

The most commonly applied methods in particle counting are laser based methods, ISO4407, and pore blockage.

- Pore Blockage - The pore blockage method uses a calibrated screen to display the concentration of particles per volume within a sample being tested. A particle count result is obtained by measuring the flow decay and pressure buildup.
- Laser-Based Methods - Laser-based methods use a laser light and detector to count particles in fluid as they pass through the laser.
- ISO4407 - The ISO4407 method involves a visual count of particles by an analyst reviewing under a microscope, or via an automated visual counting system.

Why are particles counted?

Particle counting is used a tool to monitor the condition and life of mobile and industrial equipment. Lower levels of particulates in a lubricating system can be correlated directly with the life span of a piece of equipment.

What are the benefits of particle counting?

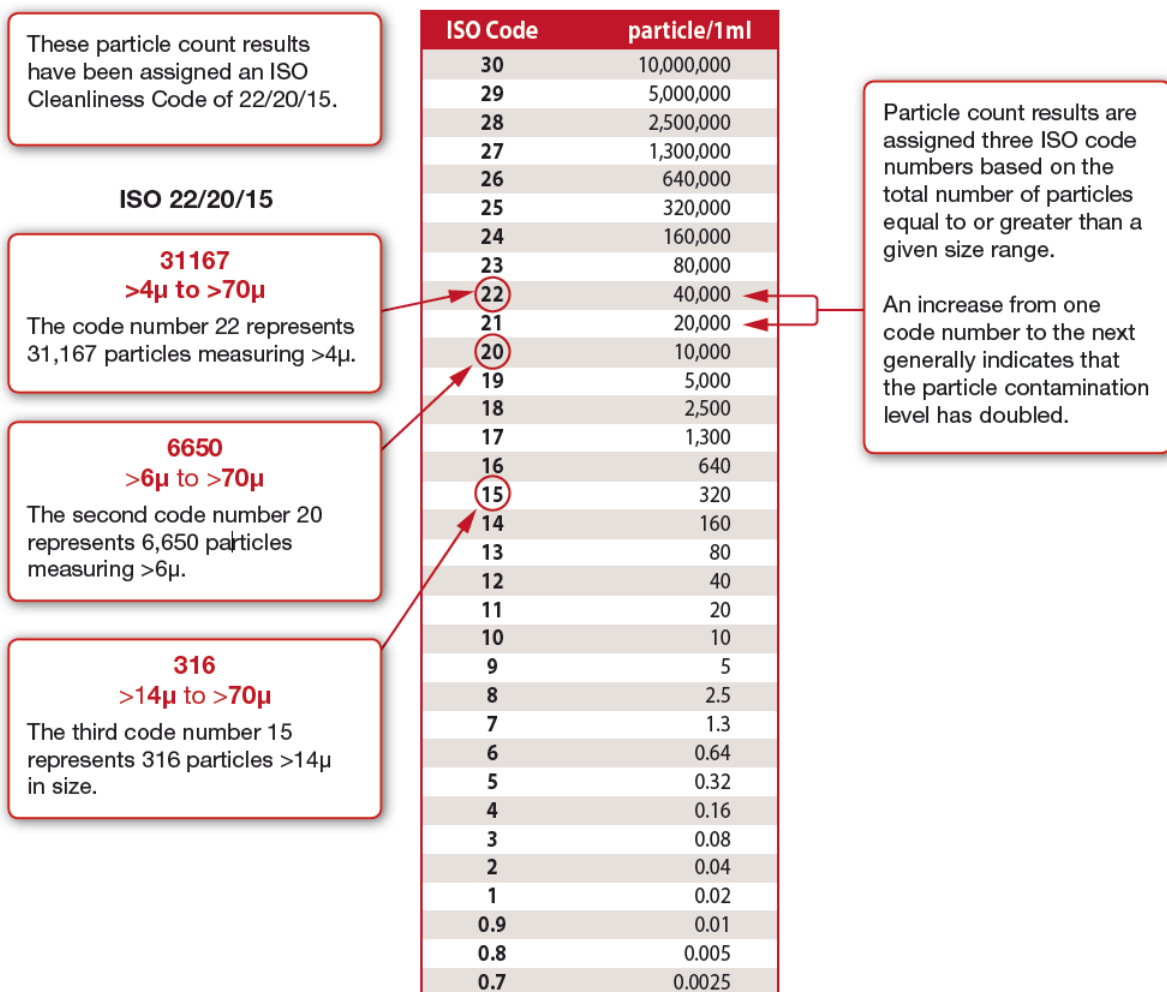
Customers can utilize particle counting as a method for quantifying cleanliness, monitoring component wear, lubricant condition and contamination. Reviewing particle count results promptly will allow you to take make informed maintenance decisions proactively and predictively.

What are the purposes of implementing particle count calibration techniques and the reporting of results standards?

Particle count calibration techniques and the reporting of results standards have been developed to assist in obtaining consistent results and meeting targeted cleanliness levels. ISO 11171 defines the proper techniques for instrument calibration while ISO 4406 simplifies the reporting of particle count data by assigning cleanliness codes based on the total number of particles in three given size ranges - for example 22/20/16.

What do the code numbers within the ISO cleanliness code for particle distribution represent?

The first cleanliness code corresponds to the number of particles greater than 4um, the second cleanliness code corresponds to the number of particles greater than 6um and the third to particles greater than 14um. Abnormal particle contamination levels are associated with increased wear, fluid contamination or degradation and loss of filter efficiency.



What are some of the advantages of implementing particle counting as a technology and methodology?

This technology allow us to report results that more accurately reflect the impact the cleanliness will have on component life; based on the cleanliness measures in place. As a methodology, this technology automates some aspects of the typical particle counting process and minimizes the possibility of human error in certain areas.

What can clients expect to see in their results?

Particle counting is a valuable part of any oil analysis program as the use of clean oil is vital for monitoring component wear and contamination. Particle count results allows clients to view the data interpretation and maintenance recommendations provided by our laboratories and take corrective actions to prevent reduced service life or overall loss of performance.

How can the best choice for particle counting be determined?

The best choice for particle counting is a laboratory prepared to help you achieve the primary goals and objectives of your testing program. The laboratories you consider should be equipped with state-of-the-art instrumentation, robust data management solutions and staffed with well-trained, experienced technicians and data analysts that can be available to address your questions. At Bureau Veritas' testing facilities, our labs understand the importance of implementing the best practices and methods available to perform particle counts and help our clients extend the life of mobile and industrial equipment.